BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

As rescanning documents *will not* correct images, please do not report the images to the Image Problem Mailbox.

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 05-120722
(43)Date of publication of application : 18.05.1993

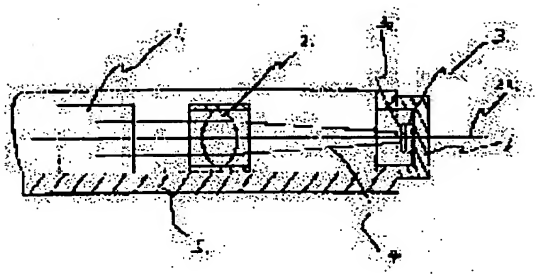
)Int.Cl. G11B 7/135
G11B 11/10

)Application number : 03-279116
!)Date of filing : 25.10.1991

(71)Applicant : SEIKO EPSON CORP
(72)Inventor : ARIMURA TOSHIO
TAKEKOSHI TARO

ł) SIGNAL LIGHT RECEIVING METHOD FOR OPTICAL HEAD

')Abstract:
IRPOSE: To reduce the loss of signal received light quantity to the ıgnation of a dust and a stain, etc., and to stably detect a signal by viating and arranging a photodetector from a lens focusing position and focusing a converged beam on the surface of the photodetector.
)NSTITUTION: After a laser beam 4 reflected from a disk transmits ·ough the optical element 1 of a beam splutter, etc., and a lens 2, nverges to the photodetector 3. In such a case, the photodetector 3 is ·ang d a little to the lens from the focusing position 2a of the lens 2. In ch a stat , since the diameter of the laser beam on the cover glass 3a of e photodetector 3 is larger than the same by conventional technique, the s of the receiving light quantity to the stagnation of a dust and a stain, :., is reduced and the signal is detected stably.



GAL STATUS
ate of request for examination]
ate of sending the examiner's decision of rejection]
ind of final disposal of application other than the aminer's decision of rejection or application converted gistration]
ate of final disposal for application]
atent number]
ate of registration]
umber of appeal against examiner's decision of ection]
ate of requesting appeal against examiner's decision of ection]
ate of extinction of right]

AIMS

---

aim(s)]
aim 1] A signal light-receiving method of an optical arm head characterized by having arranged in an optical arm
.d for optical disks which condenses signal light reflected from a disk to a photo detector 3 using a lens 2, and
forms signal detection in a location which defocused said photo detector 3 from focal location 2a of said lens 2.
aim 2] A signal light-receiving method of an optical arm head according to claim 1 characterized by having arranged
ł photo detector 3 to a regenerative-signal light sensing portion.
aim 3] A signal light-receiving method of an optical arm head according to claim 1 characterized by having arranged
ł photo detector 3 to a tracking error signal light sensing portion.

---

anslation done.]

OTICES *

his document has been translated by computer. So the translation may not reflect the original precisely.
*** shows the word which can not be translated.
1 the drawings, any words are not translated.

TAILED DESCRIPTION

tailed Description of the Invention]
01]
lustrial Application] This invention relates to the signal light-receiving method of the optical arm head for optical
ks.
02]
scription of the Prior Art] As for the optical arm head for optical disks, what condenses signal light using a lens,
nges a photo detector in the focal location of said lens, and detects the signal from a disk is common. Drawing 5 is
drawing in which the conventional example is shown, and, for 1, as for a lens and 3, optical elements, such as a
m splitter, and 2 are [a photo detector and 4] laser beams. The laser beam 4 reflected from the disk penetrates an
ical element 1 and a lens 2, and condenses to the photo detector 3 arranged to focal location 2a of a lens 2.
03]
oblem(s) to be Solved by the Invention] By the signal light-receiving method of the conventional optical arm head
optical disks, when dust, dirt, etc. adhere to the photo detector surface, it may be said that a signal cannot deteriorate
arkably or a signal cannot be reproduced. This invention is to abolish an above-mentioned defect.
04]
eans for Solving the Problem] This invention condenses signal light reflected from a disk to a photo detector using a
s, and is characterized by having arranged in a location which defocused a photo detector from a focal location of
1 lens in an optical arm head for optical disks which performs signal detection.
05]
ample]
ample 1) Drawing 1 is drawing showing the example of this invention, and, for 1, as for a lens and 3, optical
ments, such as a beam splitter, and 2 are [a photo detector and 4] laser beams. The laser beam 4 reflected from the
k condenses to a photo detector 3 after penetrating the optical elements 1, such as a beam splitter, and a lens 2.
wing 2 is the detail drawing of the photo detector section of drawing 1 . In this example, the photo detector 3 is
nged to lens 2 approach rather than focal location 2a of a lens 2. In this condition, even if dust, dirt, etc. adhere to
cover glass 3a surface of a photo detector 3, since it is large, as for light income loss, the diameter of a laser beam on
er glass 3a becomes small compared with the conventional technology. Moreover, as shown in drawing 3 , also
en arranging in the location which keeps away a photo detector 3 from a lens 2 to focal location 2a, it thinks.
06] (Example 2) The example shown in drawing 4 applies this invention to MO signal light sensing portion and the
cking error signal light sensing portion of the optical arm head for magneto-optic disks. The laser beam 4 by which
going radiation was carried out from the source 7 of laser luminescence condenses on a disk 12 after penetrating a
limator lens 8, prism 9, the shuttlecock raising prism 10, and an objective lens 11. First, in MO signal light sensing
tion, incidence of the laser beam 4 reflected from the disk 12 is carried out to prism 9 after penetrating an objective
s 11 and the shuttlecock raising prism 10, and it condenses to a photo detector 3 after penetrating Wollaston prism 13
l a lens 2. The beam diameter on a photo detector 3 is made to expand from about 20 micrometers to about 50
crometers in this example by arranging a photo detector 3 from the focal location of a lens 2 to the 0.5mm lens 2 side.
nsequently, even if dozens of micrometers dust adheres, it has composition which can receive a signal. Moreover, in
acking error signal light sensing portion, similarly, incidence of the laser beam 4 reflected from the disk 12 is carried
to prism 9 after penetrating an objective lens 11 and the shuttlecock raising prism 10, and it condenses to a photo
ector 20 after penetrating prism 14, the lens mask 18, and a lens 19. This example also arranges a photo detector 20
1 lens 19 side, and constitutes it from a focal location of a lens 19. In addition, application by disk heads other than a
gneto-optic disk is also considered.

07]
fect of the Invention] As mentioned above, the signal detection of the optical arm head for optical disks of this ention which signal light income loss could be made small and stabilized to adhesion of dust, dirt, etc. becomes sible by ZURA and arranging a photo detector from the focal location of a lens, and defocusing the convergence m in a photo detector side.

---

anslation done.]

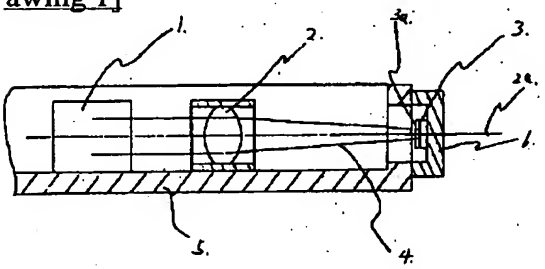
[OTICES *

his document has been translated by computer. So the translation may not reflect the original precisely.
*** shows the word which can not be translated.
ı the drawings, any words are not translated.

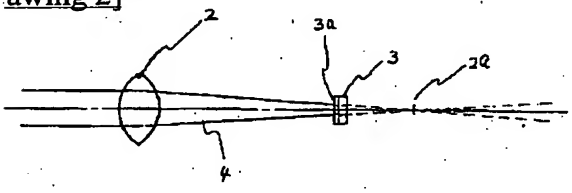
AWINGS

---

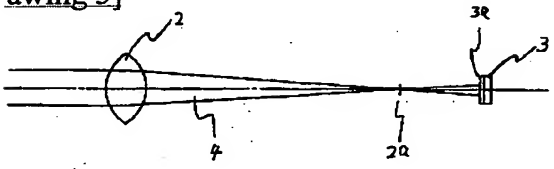
awing 1]



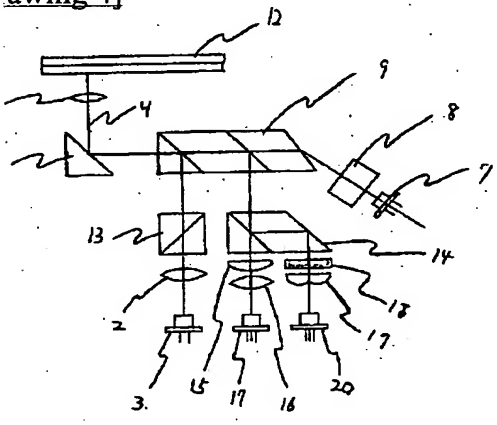
awing 2]



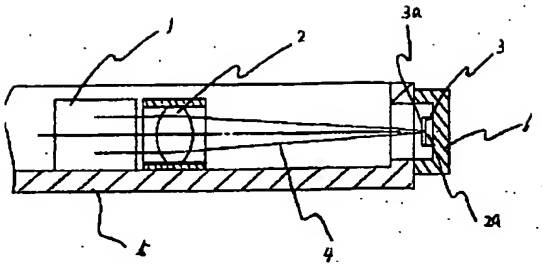
awing 3]



awing 4]



awing 5]



anslation done.]

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 05-120722
(43)Date of publicati n of application : 18.05.1993

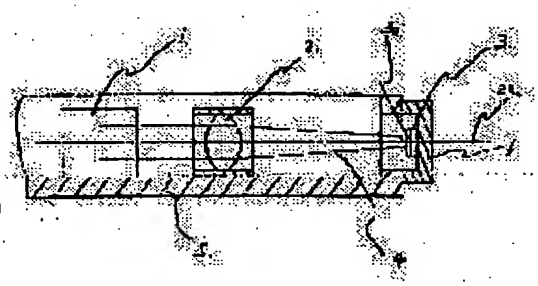
(51)Int.Cl. G11B 7/135
G11B 11/10

(21)Application number : 03-279116
(22)Date of filing : 25.10.1991

(71)Applicant : SEIKO EPSON CORP
(72)Inventor : ARIMURA TOSHIO
TAKEKOSHI TARO

(54) SIGNAL LIGHT RECEIVING METHOD FOR OPTICAL HEAD

(57)Abstract:
PURPOSE: To reduce the loss of signal received light quantity to the stagnation of a dust and a stain, etc., and to stably detect a signal by deviating and arranging a photodetector from a lens focusing position and d focusing a converged beam on the surface of the photodetector.
CONSTITUTION: After a laser beam 4 reflected from a disk transmits through the optical element 1 of a beam splutter, etc., and a lens 2, converges to the photodetector 3. In such a case, the photodetector 3 is arranged a little to the lens from the focusing position 2a of the lens 2. In such a state, since the diameter of the laser beam on the cover glass 3a of the photodetector 3 is larger than the same by conventional technique, the loss of the receiving light quantity to the stagnation of a dust and a stain, etc., is reduced and the signal is detected stably.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rej ction]

[Date of requesting appeal against examin r's decision of rej ction]

[Date of extinction of right]

(19)日本国特許庁（ＪＰ）　(12)公開特許公報（Ａ）　(11)特許出願公開番号

特開平5－120722

(43)公開日　平成５年(1993)５月18日

(51)Int.Cl.[5]	識別記号	庁内整理番号	Ｆ Ｉ	技術表示箇所
Ｇ１１Ｂ　7/135		Ｚ　8947－5Ｄ		
11/10		Ｚ　9075－5Ｄ		

審査請求　未請求　請求項の数３(全　３　頁)

(21)出願番号　特願平3－279116

(22)出願日　平成３年(1991)10月25日

(71)出願人　000002369
セイコーエプソン株式会社
東京都新宿区西新宿２丁目４番１号

(72)発明者　有村　敏男
長野県諏訪市大和３丁目３番５号セイコーエプソン株式会社内

(72)発明者　竹腰　太郎
長野県諏訪市大和３丁目３番５号セイコーエプソン株式会社内

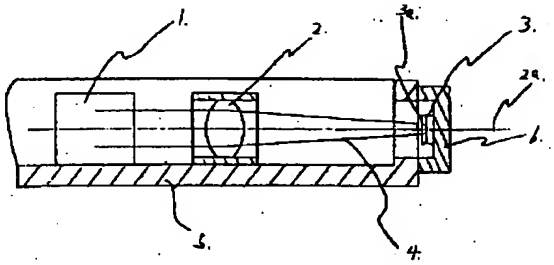
(74)代理人　弁理士　鈴木　喜三郎　(外１名)

(54)【発明の名称】　光ヘッドの信号受光方法

(57)【要約】

【目的】　光ディスク用光ヘッドの信号受光素子部において、受光素子カバーガラス表面の埃、汚れ等の付着に対して、安定した信号検出を行う。

【構成】　受光素子３をレンズ２の焦点位置２ａよりレンズ２側に配置し、受光素子３上のビームをデフォーカスする。



1

【特許請求の範囲】

【請求項１】　ディスクから反射された信号光を、レンズ２を用いて受光素子３に集光し、信号検出を行う光ディスク用光ヘッドにおいて、前記受光素子３を前記レンズ２の焦点位置２ａよりデフォーカスした位置に配置した事を特徴とする光ヘッドの信号受光方法。

【請求項２】　前記受光素子３を、再生信号受光部に配置したことを特徴とする請求項１記載の光ヘッドの信号受光方法。

【請求項３】　前記受光素子３を、トラッキングエラー信号受光部に配置したことを特徴とする請求項１記載の光ヘッドの信号受光方法。

【発明の詳細な説明】

【０００１】

【産業上の利用分野】本発明は、光ディスク用光ヘッドの信号受光方法に関するものである。

【０００２】

【従来の技術】光ディスク用光ヘッドは、信号光をレンズを用いて集光し、前記レンズの焦点位置に受光素子を配置し、ディスクからの信号を検出するものが一般的である。図５は従来の実施例を示す図面で、１はビームスプリッタ等の光学素子、２はレンズ、３は受光素子、４はレーザービームである。ディスクから反射されたレーザービーム４は、光学素子１、レンズ２を透過し、レンズ２の焦点位置２ａに配置した受光素子３に集光する。

【０００３】

【発明が解決しようとする課題】従来の光ディスク用光ヘッドの信号受光方法では、受光素子表面に埃、汚れ等が付着した場合、信号が著しく劣化したり、信号が再生出来ないという事がある。本発明は、上述の欠点をなくす事にある。

【０００４】

【課題を解決するための手段】本発明は、ディスクから反射された信号光を、レンズを用いて受光素子に集光し、信号検出を行う光ディスク用光ヘッドにおいて、受光素子を前記レンズの焦点位置よりデフォーカスした位置に配置した事を特徴とする。

【０００５】

【実施例】

（実施例１）図１は本発明の実施例を示す図で、１はビームスプリッタ等の光学素子、２はレンズ、３は受光素子、４はレーザービームである。ディスクから反射されたレーザービーム４は、ビームスプリッタ等の光学素子１、レンズ２を透過後、受光素子３に集光する。図２は図１の受光素子部の詳細図である。本実施例では、受光素子３をレンズ２の焦点位置２ａよりもレンズ２寄りに配置している。この状態で、受光素子３のカバーガラス３ａ表面に埃、汚れ等が付着しても、カバーガラス３ａ上でのレーザービーム径が従来技術に比べて大きい為、受光量損失は小さくなる。また、図３に示すように、受光素子３を焦点位置２ａに対して、レンズ２よりも遠ざける位置に配置する場合も考えられる。

2

【０００６】（実施例２）図４に示す実施例は、本発明を光磁気ディスク用光ヘッドのＭＯ信号受光部、及び、トラッキングエラー信号受光部に応用したものである。レーザー発光源７から出射されたレーザービーム４は、コリメータレンズ８、プリズム９、はね上げプリズム１０、対物レンズ１１を透過後、ディスク１２に集光する。まず、ＭＯ信号受光部では、ディスク１２から反射されたレーザービーム４は、対物レンズ１１、はね上げプリズム１０を透過後、プリズム９に入射し、ウォラストンプリズム１３、レンズ２を透過後、受光素子３に集光する。本実施例では、受光素子３をレンズ２の焦点位置より０．５ｍｍレンズ２側に配置することにより、受光素子３上のビーム径を約２０μｍから約５０μｍへと拡大させている。この結果、数十μｍの埃が付着しても、信号を受光できる構成となっている。　また、トラッキングエラー信号受光部では同様に、ディスク１２から反射されたレーザービーム４は、対物レンズ１１、はね上げプリズム１０を透過後、プリズム９に入射し、プリズム１４、レンズマスク１８、レンズ１９を透過後、受光素子２０に集光する。本実施例でも、受光素子２０をレンズ１９の焦点位置より、レンズ１９側に配置させて構成している。その他にも、光磁気ディスク以外のディスクヘッドでの応用も考えられる。

【０００７】

【発明の効果】上述のように、本発明の光ディスク用光ヘッドは、受光素子をレンズの焦点位置よりズラして配置し、受光素子面での収束ビームをデフォーカスすることにより、埃、汚れ等の付着に対して信号受光量損失を小さく出来、安定した信号検出が可能となる。

【図面の簡単な説明】

【図１】　本発明の実施例を示す図である。

【図２】　本発明の実施例を示す図１の部分詳細図である。

【図３】　本発明の実施例を示す図１の部分詳細図である。

【図４】　本発明の実施例を示す図である。

【図５】　従来の実施例を示す図である。

【符号の説明】

１　光学素子
２、１６、１９　レンズ
２ａ　焦点位置
３、１７、２０　受光素子
３ａ　カバーガラス
４　レーザービーム
５　ヘッドきょう体
６　受光素子板
７　レーザー発光源
８　コリメータレンズ

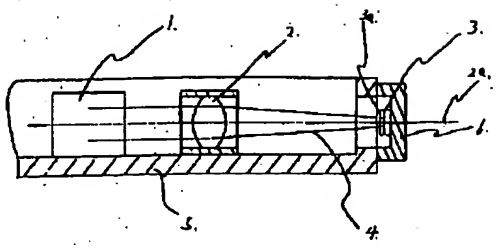
3

９、１４　プリズム
１０　はね上げプリズム
１１　対物レンズ
１２　ディスク

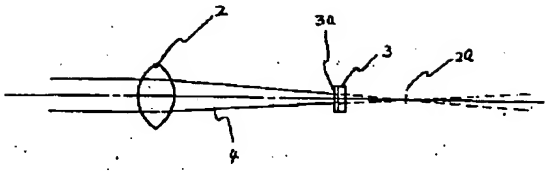
4

１３　ウォラストンプリズム
１５　シリンドリカルレンズ
１８　レンズマスク

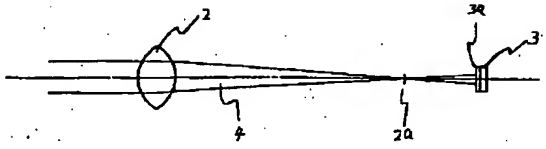
【図１】



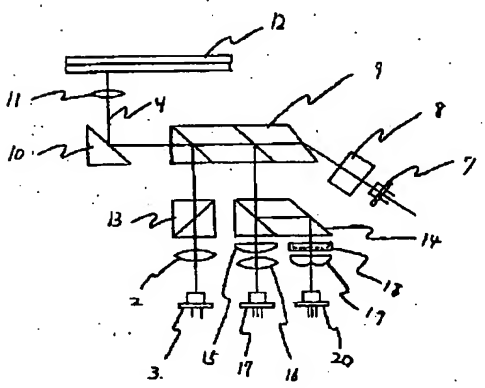
【図２】



【図３】



【図４】



【図５】